

Abstract Submitted
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Light Emission from Silicon Nanocrystallites

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Visible Photoluminescence of Porous SiGe Obtained by
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We have investigated visible photoluminescence (PL) from thin porous
 $\text{Si}_{1-x}\text{Ge}_x$ alloy layers prepared by stain etching, from the molecular
beam epitaxy grown material. Seven samples with nominal Ge fraction
 x varying from 0.03 to 0.60 were studied at room temperature and 80
K. Samples of bulk stain etched Si and Ge were also investigated. The
composition of the porous material was determined using X-ray
photoemission spectroscopy and Rutherford backscattering techniques.
While the PL intensity drops significantly with increasing Ge fraction,
we observe no significant variations in the PL wavelength with
composition x at room temperature. This is clearly in contrast with
the popular model based on quantum confinement in crystalline silicon
which predicts the luminescence energy varying in agreement with the
band gap of the starting material. On the other hand, the compositional
dependence of the PL intensity is consistent with small units containing
only a few Si atoms being responsible for the light emission, this work
has been supported by S101/1 S11'.

Preferred standard session

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